

The Effects of Daytime and Nighttime Chemistry on Air Quality Forecasts

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NOAA's air quality forecast program focuses on tropospheric ozone and aerosol because these pollutants have significant effects on human health. Nitric oxide and nitrogen dioxide together are known as NO_x. NO_x is an important precursor to ozone and aerosol formation and processes that affect NO_x concentrations will have a strong effect on daytime ozone and aerosol formation. Measurements of NO_x and organic compounds have been made at Howard University's Beltsville Center for Climate System Observation (BCCSO) and the Desert Research Institute in Reno, NV. The Regional Atmospheric Chemistry Mechanism, version 2 (RACM2) and other mechanisms are being used to model these field measurements. The gas-phase chemical mechanism is an essential component for air quality forecast models. Process analysis and sensitivity analysis are used to calculate the response of ozone and aerosol to variations in the mechanisms and to emissions. Comparisons between measurements and RACM2 forecasts and between the forecasts made with other mechanisms are being used to refine the RACM2 mechanism. The results of these studies will be presented.

Reference

(1) Stockwell, W.R.; Lawson, C.V.; Saunders, E.; Goliff, W.S. *A Review of Tropospheric Atmospheric Chemistry and Gas-Phase Chemical Mechanisms for Air Quality Modeling. Atmosphere*. **2012**, 3, 1-32.